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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,416	03/30/2004	Tetsuzo Ueda	43890-673	1264

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EXAMINER
ARENA, ANDREW OWENS

ART UNIT	PAPER NUMBER
2811	

MAIL DATE	DELIVERY MODE
04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,416	UEDA ET AL.	
	Examiner	Art Unit	
	Andrew O. Arena	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2, 3, 5 and 51-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2, 3, 5 and 51-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

The arguments filed 12/02/2008 that the previous rejection does not disclose the presently amended features have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of the newly found reference Takeya (US 2003/0136970)

Claim Rejections - 35 USC § 103

Claims 2, 3, 5, and 51-59 are rejected under 35 U.S.C. § 103(a) as obvious in view of Takeya (US 2003/0136970) and Onojima (Appl. Phys. Lett. V.83 N.25 pg5208).

RE claim 51, Takeya discloses a semiconductor device comprising:

a first III-V Nitride semiconductor epitaxial film (2, ¶112 ln 1-5) having a main plane and having a polytype structure selectively formed in contact with a substrate (1, ¶105 ln 4; which is SiC, ¶172 ln 1-2) having a polytype structure, wherein said first III-V Nitride semiconductor epitaxial film is an AlN film (¶172 ln 4-6),

a seed layer (3) of III-V Nitride (¶105 ln 10) having a polytype structure selectively formed on said first III-V Nitride semiconductor epitaxial film, wherein said seed layer contains Ga, the seed layer having a shape of a stripe along the <1-100> direction (¶113 ln 15-17), and

a second III-V Nitride semiconductor epitaxial film (4) having a polytype structure formed on said first III-V Nitride semiconductor epitaxial film, wherein said second III-V Nitride semiconductor epitaxial film contains Ga (¶105 ln 12) and is in contact with said seed layer.

Takeya differs from the claimed invention only in not explicitly disclosing said main plane and said polytype.

Onojima teaches that high-performance devices may be realized with 4H-AlN epitaxially grown (e.g., pg 5208 col 2 ln 3-5) on – thus having the same main plane as - 4H-SiC (11-20) substrates (e.g., pg 5210 col 2 ln 13-16) and that such arrangements are desirable in the art due to certain appreciated advantages (pg 5208 col 1 ln 1-4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that said main plane is (11-20) and that said polytype is 4H; at least for the advantages of such arrangement. Also see MPEP § 2144.06-2144.07.

RE claim 2, Takeya discloses the substrate is silicon carbide (SiC: ¶172 ln 1-2).

RE claim 3, the combination of Takeya and Onojima discloses said III-V Nitride semiconductor epitaxial film is formed in contact with a substrate having (11-20) face.

RE claim 5, the combination of Takeya and Onojima discloses a number of group III atoms are equal to a number of nitrogen atoms on a surface of said III-V Nitride semiconductor epitaxial film (inherent in (11-20) main plane of this material).

RE claim 58, Takeya discloses the structure required by this product-by-process claim. See MPEP § 2113. Further, Takeya discloses epitaxial growth (¶112 - ¶118).

RE claim 52, Takeya discloses an optoelectronic device comprising,

a first III-V Nitride semiconductor epitaxial film (2, ¶112 ln 1-5) having a main plane and having a polytype structure selectively formed in contact with a substrate (1, ¶105 ln 4; which is SiC, ¶172 ln 1-2) having a polytype structure;

a seed layer (3, ¶113 ln 15-17) of III-V Nitride (¶105 ln 10) having a polytype structure selectively formed on said first III-V Nitride semiconductor epitaxial film,

a second III-V Nitride semiconductor epitaxial film (4-13, ¶105 ln 12) having a polytype structure formed on said first III-V Nitride semiconductor epitaxial film; and

a waveguide (14; referred to as SCH: ¶11) formed on said second III-V Nitride semiconductor epitaxial film,

wherein said first III-V Nitride semiconductor film is an AlN film (¶172 ln 4-6),

said seed layer contains Ga and has a shape of a stripe along the 1-100> direction (¶113 ln 15-17),

said second III-V Nitride semiconductor epitaxial film contains Ga (¶105 ln 12) and is in contact with said seed layer, and

said second III-V Nitride semiconductor epitaxial film includes an n-type layer, a p-type layer and an active layer (¶105 ln 18-34), said active layer (7, ¶106 ln 10) being formed between said n-type layer and said p- type layer.

Takeya differs from the claimed invention only in not explicitly disclosing said main plane and said polytype.

Onojima teaches that high-performance devices may be realized with 4H-AlN epitaxially grown (e.g., pg 5208 col 2 ln 3-5) on – thus having the same main plane as - 4H-SiC (11-20) substrates (e.g., pg 5210 col 2 ln 13-16) and that such arrangements are desirable in the art due to certain appreciated advantages (pg 5208 col 1 ln 1-4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that said main plane is (11-20) and that said polytype is 4H; at least for the advantages of such arrangement. Also see MPEP § 2144.06-2144.07.

RE claim 53, Takeya discloses a plurality of layers is disposed between said waveguide and said substrate (Fig 1, ¶105).

RE claim 54, the combination of Takeya and Onojima discloses said substrate having 4-H type structure is SiC.

RE claim 55, the combination of Takeya and Onojima discloses said first III-V Nitride semiconductor epitaxial film is formed on a substrate having (11-20) face.

RE claim 56, the combination of Takeya and Onojima discloses a number of group III atoms are equal to a number of nitrogen atoms on a surface of said III-V Nitride semiconductor epitaxial film (inherent in (11-20) main plane of this material).

RE claim 57, Takeya discloses said waveguide is formed as a straight line perpendicular to either (0001) face or (1-100) face (¶108 ln 3-8).

RE claim 59, Takeya discloses the structure required by this product-by-process claim. See MPEP § 2113. Further, Takeya discloses epitaxial growth (¶112 - ¶118).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is 571-272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571- 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more info about PAIR, see http://pair-direct.uspto.gov. For questions PAIR access, contact the Electronic Business Center at 866-217-9197 (toll-free). For assistance from a USPTO Customer Service Rep or access to the automated info system, call 800-786-9199 or 571-272-1000.

/Andrew O. Arena/
Examiner, Art Unit 2811
30 March 2009

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811